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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/921,786	08/06/2001	Bernard Drevillon	000348-280	7374

7590

03/17/2003

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EXAMINER

ORTIZ RODRIGUEZ, CARLOS R

ART UNIT PAPER NUMBER

2125

DATE MAILED: 03/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,786

Applicant(s)

DREVILLON ET AL.

Examiner

Carlos Ortiz-Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 14-27, 30 and 31 is/are rejected.
- 7) ☒ Claim(s) 11, 13, 28, 29, 32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claim 1 is objected to because of the following informalities: the word “structre” should read “structure”. Appropriate correction is required.

3. Claims 20 and 21 are objected to because of the following informalities: the word “tht” should read “that”. Appropriate correction is required.

4. Claim 17 is objected to because of the following informalities: it refers to claim 14, this makes it identical to claim 16.

5. Claims 11,13,28,29,32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-10 and 14-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kildemo et al., "Real time control of the growth of silicon alloy multilayers by multiwavelength ellipsometry"; Thin Solid Films, Vol. 290-291; Dec. 1996; pages 46-50.

With respect to claim 1, Kildemo et al. discloses a method for real-time control of the fabrication of a thin-film structure comprising a substrate by ellipsometric measurement(see abstract lines 1 and 2)

in which: variables directly linked to the ellipsometric ratio $\rho = \tan \Psi \exp(i\Delta)$ are measured(see pg.47, col.1 line 10);

and the said variables are compared with reference values(see pg.46, col.2 lines 3 and 4), characterized in that the comparison relates to the length of the path traveled at a time t in the plane of the variables with respect to an initial point at time $t_{sub.0}$, for each layer participating in the thin-film structure(see pg. 48 col.1 lines 29-32).

With respect to claim 2, Kildemo et al. discloses a control method, characterized in that the said variables are a combination of the parameters Ψ and Δ .(see equation 1) .

With respect to claim 3, Kildemo et al. discloses a control method, characterized in that the said variables are a combination of trigonometric functions of the parameters Ψ and Δ .(see equation 1).

With respect to claim 4,14 and 15, Kildemo et al. discloses a control method, characterized in that the ellipsometric measurement is one with phase modulation (see pg.50,

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col.2 line 9).

With respect to claim 5,16 and 17, Kildemo et al. discloses a control method, characterized in that the measured variables are, respectively: $I_{\text{sub.s}} = (\sin^2 \Psi \sin \Delta)$ and $I_{\text{sub.c}} = (\sin^2 \Psi \cos \Delta)$ or $I_{\text{sub.c}} = \cos^2 \Psi$. (see pg.47, col.1, equation 1).

With respect to claim 6,18 and 19, Kildemo et al. discloses a control method, characterized in that the ellipsometric measurement is carried out using the method called "rotating polarizer" method (see Fig 1).

With respect to claim 7,20 and 21, Kildemo et al. discloses a control method, characterized in that the measured variables are $\tan \Psi$. (see pg.47 line 10) and $\cos \Delta$. (see equation 1, also see Fig.1).

With respect to claim 8,22 and 23, Kildemo et al. discloses a control method, characterized in that the ellipsometric measurement is a multiwavelength measurement (see abstract line 1).

With respect to claim 9,24 and 25, Kildemo et al. discloses a control method, characterized in that the reference values form a theoretically determined path (see Fig 5).

With respect to claim 10,26 and 27, Kildemo et al. discloses a control method, characterized in that the reference values form an experimentally determined path (see pg 46, col.2 line 4).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 12,30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kildemo et al., "Real time control of the growth of silicon alloy multilayers by multiwavelength ellipsometry"; Thin Solid Films, Vol. 290-291; Dec. 1996; pages 46-50, in view of Stehle et al. U.S. Pub. No. 2002/0024668.

Regarding claims 12,30, and 31, Kildemo et al. discloses all the limitations based on claims 1,2 and 3. But Kildemo et al. fails to disclose a control method, characterized in that the path traveled is adjusted by a polynomial of order between 1 and 5.

However, Stehle et al. discloses a polynomial of order 2 used for adjustments (see Fig. 8). Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to utilize a polynomial for adjusting the path traveled.

One of ordinary skill in the art would have been motivated to include this feature in Kildemo's method because polynomial approximations can be used to correct measurements as suggested by Stehle.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to method for real-time control of the fabrication of a thin-film structure by ellipsometric measurement:

- a. U.S. Pat. No. 5,608,526 to Piwonka-Corle et al., which discloses a focused beam spectroscopic ellipsometry method and system.
- b. U.S. Pat. No. 5,706,212 to Thompson et al., which discloses infrared ellipsometer/polarimeter system, method of calibration, and use thereof.
- c. U.S. Pat. No. 5,910,842 to Piwonka-Corle et al., which discloses a focused beam spectroscopic ellipsometry method and system.
- d. U.S. Pat. No. 6,381,008 to Branagh et al., which discloses a method and system for identifying etch end points in semiconductor circuit fabrication.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is (703) 305-8009. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (703) 308-0538. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-6606.

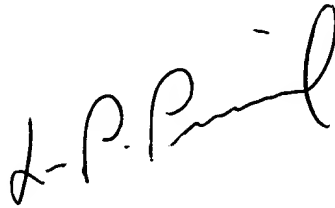
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Carlos Ortiz-Rodriguez
Patent Examiner
Art Unit 2125

cror

March 7, 2003

A handwritten signature in black ink, appearing to read "L. Picard", written diagonally across the page.

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100